

**ENVIRONMENTAL ASSESSMENT OF A
NATIONAL MARINE FISHERIES SERVICE ACTION
OF ISSUING A PERMIT (#1196) TO THE
WASHINGTON DEPARTMENT OF FISH AND WILDLIFE
UNDER SECTION 10(a)(1)(A) OF THE
ENDANGERED SPECIES ACT**

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I. PURPOSE OF AND NEED FOR THE PROPOSED ACTION

A. Purpose of and Need for the Proposed Action

On December 9, 1998, National Marine Fisheries Service (NMFS) received an application for an Endangered Species Act (ESA) section 10(a)(1)(A) permit from the Washington Department of Fish and Wildlife (WDFW) (WDFW 1998) requesting a multi-year authorization for an annual take of Upper Columbia River (UCR) spring chinook salmon (*Oncorhynchus tshawytscha*), and UCR steelhead (*O. mykiss*) associated with proposed hatchery supplementation programs. The application was submitted in anticipation of the formal listing of this evolutionarily significant unit (ESU) as endangered in the spring of 1999. The UCR spring chinook salmon ESU was listed as endangered on March 24, 1999 (64 FR 14308). The purpose of this environmental assessment (EA) is to evaluate the potential environmental effects as a consequence of the NMFS action of issuing section 10(a)(1)(A) permit #1196 to the WDFW for an annual take of endangered UCR spring chinook salmon and UCR steelhead associated with the proposed artificial propagation programs.

The purpose of and need for the issuance of the section 10(a)(1)(A) permit #1196 is to ensure that the activities covered under the permit have been thoroughly analyzed for adverse impacts to listed species, are in compliance with the ESA, and to ensure the continuation of the programs and their implementation. NMFS is the lead agency responsible for enacting the ESA as it relates to listed salmon and steelhead. Actions which may affect listed species are reviewed by NMFS through section 7 or section 10 of the ESA. Under section 10(a)(1)(A) of the ESA, non-Federal entities may apply for permits from NMFS to take ESA-listed species under the jurisdiction of NMFS if such taking is for scientific purposes or to enhance the propagation or survival of the affected species.

B. Scope of Action

The action is issuance of the ESA section 10(a)(1)(A) permit #1196. Potential effects come as a result of the artificial propagation activities proposed by WDFW for the Upper Columbia River. These actions include collecting adult UCR spring chinook salmon, spawning adults in a hatchery environment, releasing the resulting progeny in the respective stream of origin to supplement the naturally spawning populations in the Upper Columbia River Basin, and conducting associated scientific research and monitoring activities. The proposed artificial propagation programs include the use of more than one artificial propagation strategy, incremental changes in production levels, predetermined means to manage stray fish, and two approaches for population separation. All aspects will be monitored in a manner that allows comparison of the effectiveness of the alternative strategies. Initial recovery options are based upon continued use, and modification as necessary, of existing hatcheries built in the mid- and upper Columbia River region for spring chinook salmon production. Progeny derived from the ESA-listed species, even when artificially propagated, remain listed under the ESA (April 5, 1993, 58 FR 17573). The proposed actions are expected to directly affect only UCR spring chinook salmon. However,

endangered UCR steelhead, and threatened bull trout (*Salvelinus confluentus*) may be indirectly taken during the hatchery activities.

The scope of the action considered here only includes WDFW's proposed hatchery supplementation programs and their effect on the ESA-listed species. Other activities in the Columbia River Basin, and other harvest activities outside the Columbia River Basin, might have impacts on the abundance and survival of the ESA-listed species. Those other activities have been discarded from the analysis in this EA because their planning, regulation, and implementation fall outside the scope of this EA.

C. Action Area

This EA's action area is within the upper Columbia River Basin and, more specifically, the Methow River and Wenatchee River subbasins and artificial propagation facilities along the mainstem Columbia River (Figure 1). The action area in the Wenatchee River subbasin includes the Chiwawa River and weir, Nason Creek and weir, Dryden Dam and Tumwater Dam. The Wenatchee River watershed drains a portion of the east Cascade Mountains in north central Washington. The mainstem flows generally in a southeasterly direction, emptying into the Columbia River at river mile (RM) 468.4. The watershed encompasses approximately 1,327 square mile, with 230 miles of major streams and rivers. The watershed originates in the high mountainous regions of the Cascade Crest, with numerous tributaries draining subalpine regions within the Alpine Lakes and Glacier Peak wilderness areas. The Little Wenatchee and White Rivers flow into Lake Wenatchee, the source of the Wenatchee River. From the lake outlet (RM 54.2) the river descends rapidly through Tumwater Canyon, dropping into a lower gradient section in the region of Leavenworth, where Icicle Creek joins the mainstem (RM 25.6). Other major tributaries include Mission, Peshastin, Chumstick and Chiwaukum creeks, Chiwawaw River and Nason Creek (WDF *et al.* 1990).

The action area in the Methow River subbasin includes the Twisp River and weir, Chewuch River and weir, Foghorn Dam and Methow State Fish Hatchery (SFH). The Methow River watershed encompasses about 1,800 square miles and is located in north central Washington with its source on the eastern slopes of the Cascade Mountains, and flows southeasterly to enter the Columbia River at RM 524. The Methow SFH is located at approximately RM 44 on the Methow River, below the Foghorn Dam located at approximately RM 46. The Twisp weir is located at RM 5 on the Twisp River and the Chewuch weir is located at the Fulton Dam above the mouth of the Chewuch River at RM 6.

The biological attributes of salmon and steelhead, the dimensions and variability in the Columbia River system and the cycles in the ocean environment make determination of the effects from the proposed artificial propagation activities downstream of the Methow and Wenatchee rivers very difficult. This difficulty is due to the fact that the impacts to fish in the Columbia River mainstem corridor and ocean environments from the proposed artificial propagation programs are very small. Impacts from the WDFW's artificial propagation programs outside the action area

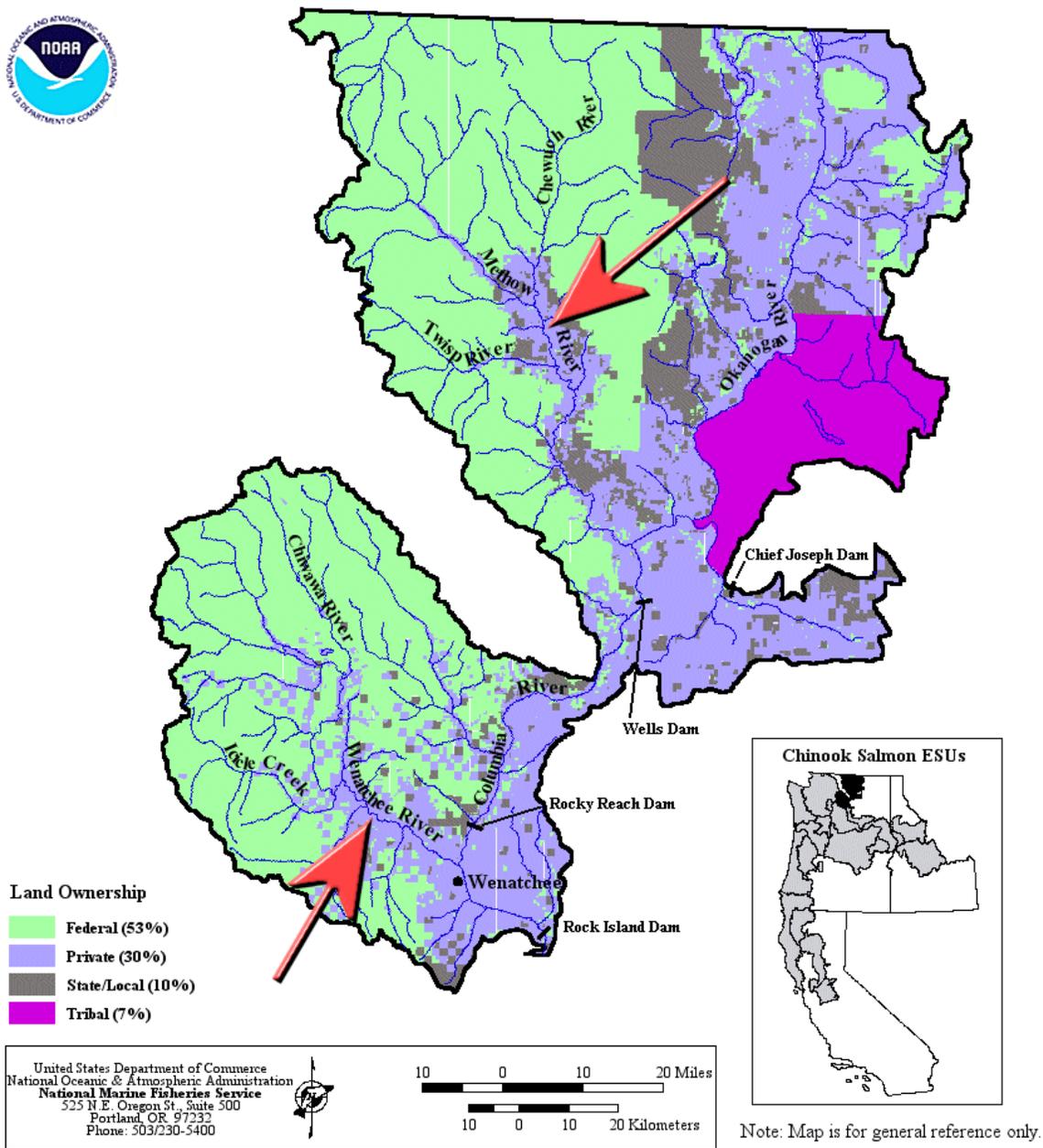


Figure 1. Geographic extent of the Upper Columbia River spring-run chinook salmon Evolutionarily Significant Unit and location of the Wenatchee and Methow rivers.

are likely small enough to be negligible, and therefore impacts in the area downstream of the action area will not be considered further in this assessment.

II. ALTERNATIVES INCLUDING THE PROPOSED ACTION

The proposed action and two alternatives considered in this EA are: (1) to issue the permit with conditions (proposed action), (2) to issue the permit without conditions, and (3) to not issue a permit (no action). The following summary describes major aspects of the proposed alternatives.

A. Alternative 1 - Issue Permit with Conditions (Proposed Action)

The proposed action is to issue a permit under section 10(a)(1)(A) of the ESA based on the application, including attachments, submitted by WDFW as modified by the conditions that NMFS may require as being necessary and appropriate. NMFS' conditions will ensure that the annual take of ESA-listed anadromous fish will be for the propagation and enhancement of the ESA-listed chinook salmon population and the associated scientific research and monitoring activities. NMFS' conditions are designed to ensure that the annual take will not appreciably reduce the likelihood of the survival and recovery of the species in the wild. The permit would expire December 31, 2007.

1. Hatchery Supplementation Program

WDFW operates two hatchery complexes within the mid- and upper Columbia River Basin for the propagation of spring chinook salmon: Methow Fish Hatchery Complex and Rock Island Fish Hatchery Complex. These complexes are funded by the Public Utility Districts in the upper Columbia River region for the purpose of conducting supplementation programs for the naturally spawning chinook salmon populations present in the Methow and Wenatchee rivers, respectively (Chapman et al. 1995). The Methow Complex uses returning spring chinook salmon adults collected at weirs on the Methow River and its tributaries, the Twisp River and the Chewuch River. More recently, up-river-bound spring chinook salmon adults have been collected at Wells Dam and propagated at Methow SFH. The Rock Island Complex uses spring chinook salmon broodstock collected at weirs on the Chiwawa River and Nason Creek, tributaries of the Wenatchee River, and at Tumwater Dam on the mainstem Wenatchee River. WDFW's Eastbank Hatchery is part of the Rock Island Complex. WDFW-managed satellite programs included within the two complexes are the Twisp Pond, Chiwawa Ponds, Chewuch Pond, and the aforementioned adult collection weirs on the Methow, Chiwawa, Twisp, and Chewuch Rivers and Nason Creek (WDFW 1998).

The WDFW's permit application includes ESA-listed spring chinook salmon artificial propagation activities occurring at the two hatchery complexes, proposed for a five year period commencing in 2001. Through these programs, spring chinook salmon within the UCR spring chinook salmon ESU will be intentionally taken by WDFW for the purpose of enhancing the

status of the species through supplementation. Supplementation program activities that will lead to the intentional take of the ESA-listed species will include:

- the collection of broodstock through WDFW trapping operations at Wells Dam for Methow River populations (with potential collection on the Twisp River, Chewuch River, at Foghorn Dam on the Methow River, and at Methow SFH) and on the Chiwawa River, Nason Creek and/or Tumwater Dam for Wenatchee River Basin-origin spring chinook salmon;
- the transfer of adults and fertilized eggs between the Methow SFH and Winthrop National Fish Hatchery (NFH);
- the holding and artificial spawning of adults at the Methow and Eastbank hatcheries;
- the incubation and propagation from the fertilized egg through the smolt life stage at the Methow and Eastbank hatcheries;
- the transfer of fingerlings and pre-smolts from the two hatcheries for rearing in acclimation ponds on the Chiwawa, Twisp, and Chewuch rivers; and
- the release of smolts into the Methow, Chewuch, Twisp, and Chiwawa Rivers from the WDFW hatcheries and acclimation ponds on those systems.

2. Special Conditions

NMFS proposes to issue a section 10(a)(1)(A) permit to WDFW with special conditions. NMFS in the Biological Opinion has determined that the non-discretionary conditions would ensure that the annual take of endangered UCR spring chinook salmon will not appreciably reduce the likelihood of survival and recovery of the species in the wild. Specifically, NMFS' conditions are designed to minimize ESA-listed fish mortalities incidental to the collection and spawning of adult UCR spring chinook salmon, releasing the resulting progeny in the respective stream of origin to supplement the naturally spawning populations in the upper Columbia River Basin, and associated scientific research and monitoring activities. Of primary concern in the development of the conditions for the proposed permit is the necessity to take special measures to avoid adverse impacts from artificial propagation and to preserve the genetic and life history characteristics of the ESA-listed species. A summary list of the terms and conditions to be placed in the permit follows (for a complete list of conditions see Permit #1196 and the Opinion):

Intentional Take - Wenatchee River Basin (Rock Island Complex)

1. Adult and jack, endangered, UCR spring chinook salmon (both natural and hatchery origin) that return to the Chiwawa River and Nason Creek weirs and Tumwater Dam each year may be captured, anesthetized, and handled (enumerated, measured, sampled for tissues and/or scales).
2. Of the combined total number of spring chinook salmon adults and jacks that return to the Chiwawa River and Nason Creek each year, WDFW may retain no more than 400 or one-third, whichever is less, for broodstock to meet the long-term smolt production goals of the program. The ESA-listed adult chinook

salmon retained for broodstock may be transferred to transport vehicles and transported to WDFW's spawning facility.

3. The adult and jack, endangered, UCR spring chinook salmon not retained for broodstock must be released unharmed above the respective trapping facility for natural spawning immediately after being enumerated.
4. The ESA-listed adult fish retained for broodstock may be marked and/or tagged, treated with antibiotics, placed in holding ponds, and spawned. Sperm from ESA-listed adult males may be cryopreserved for potential future use. Carcasses of the ESA-listed fish spawned in captivity may be outplanted in the Chiwawa River and Nason Creek watersheds for nutrient enrichment if disease protocols as determined by fisheries co-managers are met.
5. The resulting eggs generated from the supplementation program may be incubated and the ESA-listed juvenile fish progeny may be reared in captivity. ESA-listed juvenile fish produced from WDFW's supplementation program may be tagged/marked with coded wires, passive integrated transponders, fin clips, and/or other biological identifiers.
6. Up to 672,000 juvenile, endangered, artificially propagated, UCR spring chinook salmon, progeny generated from the supplementation program, may be transported from the hatchery and released into acclimation ponds on the Chiwawa River for subsequent volitional out-migration and/or released directly into the Chiwawa River when they are ready to out-migrate.
7. ESA-listed juvenile fish within the hatchery environment may be monitored to acquire meristic and morphological information or sacrificed to obtain otoliths for future reference and/or to obtain pertinent pathological or physiological information. Indirect mortalities of adult ESA-listed fish associated with capturing, handling, and transporting activities must not exceed 5 percent of the total adult fish collected.

Intentional Take - Methow River Basin

8. Adult and jack, endangered, UCR spring chinook salmon (both natural and hatchery origin) that return to Wells Dam, the Twisp River trap, the Chewuch River trap, and Foghorn Dam each year may be captured, anesthetized, and handled (enumerated, measured, sampled for tissues and/or scales).
9. WDFW may retain adult and jack, endangered, UCR spring chinook salmon that return to Wells Dam (and when necessary the Twisp River trap, Chewuch River trap, Foghorn Dam, Winthrop NFH, and/or the Methow SFH) for use as broodstock. Broodstock collected by WDFW may be used in WDFW's and in

U.S. Fish and Wildlife Service's (USFWS) Methow River Basin supplementation programs. Of the adult and jack spring chinook salmon captured and retained for broodstock at Wells Dam, the Twisp River trap, the Chewuch River trap, and Foghorn Dam, WDFW shall retain a representative sample of both hatchery and naturally produced fish. The annual production goal for WDFW's supplementation program at Methow SFH of 550,000 smolts shall be used until modifications at the fish hatchery is made. Under this production goal scenario, when the total annual adult return to Wells Dam is predicted to be 668 adults or fewer, then all of the adult fish may be retained and placed into WDFW and USFWS' adult-based supplementation programs. When the total annual adult return to Wells Dam is predicted to be 669 to 964, up to 69 percent of the adult run may be placed into WDFW and USFWS' adult-based supplementation programs and a minimum of 296 adults shall be passed upstream of the dam for natural spawning. When the total annual adult return to Wells Dam is predicted to be over 964, the retention of adults shall be at levels that will meet maximum production objectives for WDFW and USFWS' programs.

10. The ESA-listed adult chinook salmon retained for broodstock may be transferred to transport vehicles and transported to WDFW's spawning facility or USFWS' Winthrop NFH. Handling of ESA-listed adult fish by USFWS is authorized under a separate take authorization.
11. The adult and jack, endangered, UCR spring chinook salmon not retained for broodstock must be released unharmed above the respective trapping facility for natural spawning immediately after being enumerated.
12. The ESA-listed adult fish retained for broodstock may be marked and/or tagged, treated with antibiotics, placed in holding ponds, and spawned. Sperm from ESA-listed adult males may be cryopreserved for potential future use. Carcasses of the ESA-listed fish spawned in captivity may be outplanted in the Methow River watershed for nutrient enrichment if disease protocols as determined by fisheries co-managers are met.
13. The resulting eggs generated from the supplementation program may be incubated and the ESA-listed juvenile fish progeny may be reared in captivity. ESA-listed juvenile fish produced from WDFW's supplementation program may be tagged/marked with coded wires, passive integrated transponders, fin clips, and/or other biological identifiers.
14. Up to 550,000 juvenile, endangered, artificially propagated, UCR spring chinook salmon, progeny generated from WDFW's supplementation program, may be transported from the hatchery and released into acclimation ponds on the

Chewuch and Twisp rivers for subsequent volitional out-migration and/or released directly into the Chewuch River when they are ready to out-migrate.

15. ESA-listed juvenile fish within the hatchery environment may be monitored to acquire meristic and morphological information or sacrificed to obtain otoliths for future reference and/or to obtain pertinent pathological or physiological information. Indirect mortalities of ESA-listed fish associated with capturing, handling, and transporting activities must not exceed 5 percent of the total adult fish collected.
16. The progeny produced from the Methow SFH shall be released on-station or transferred to the Chewuch Pond as subyearlings for acclimation and release. The progeny of known Twisp River spring chinook salmon shall be acclimated and released from the Twisp Pond or on-station. A portion of the eggs/progeny from the Methow SFH may be transferred to the Winthrop NFH for rearing and release.

Incidental Take

17. Incidental take of ESA-listed UCR steelhead during WDFW's broodstock collection activities is authorized. During collection of spring chinook salmon broodstock at Wells Dam, WDFW may handle up to 100 listed steelhead when trapping occurs at both adult fish ladders. Trapping of spring chinook salmon in both ladders is necessary when the annual adult return is such that all adults collected will be retained for broodstock. As the annual return increases, trapping will be limited to the west ladder which reduces the potential to handle listed steelhead to less than 10 adults. Lethal take of listed steelhead is expected to be no more than 9 adults.
18. Incidental takes of ESA-listed species associated with WDFW's broodstock collection activities, hatchery operations, and juvenile fish releases from the program are authorized. Because of the inherent biological attributes of aquatic species such as salmon and steelhead, the dimensions and variability of the Columbia and Snake River system and tributaries, and the operational complexities of hatchery actions, determining precise incidental take levels of ESA-listed species attributable to WDFW's hatchery activities are not possible at present. In the absence of quantitative estimates of incidental take, WDFW will provide to NMFS fish release numbers/locations and other information on WDFW's hatchery operations to assure that incidental take is minimized to the extent necessary to protect ESA-listed species. If incidental takes due to WDFW's hatchery activities have the potential to jeopardize a listed species, WDFW must suspend the activities that result in the incidental takes until a reasonable solution is achieved, this permit is amended, and/or WDFW's program is reevaluated under Section 7 of the ESA.

Special Conditions

- a. In cooperation with the Joint Fishery Parties (Federal, state and tribal co-managers) and the Mid-Columbia Coordinating Committee, WDFW shall develop annual broodstock objectives and site-based broodstock collection protocols for the UCR spring chinook salmon supplementation program. The annual broodstock objectives and protocols shall be submitted to the Hatcheries and Inland Fisheries Branch, NMFS by April 15 each year. NMFS will provide a letter of approval, if it is determined that the annual broodstock objectives and protocols are consistent with the terms and conditions of this permit.
- b. Each year, WDFW shall operate the Nason Creek and Chiwawa River weirs from June 1 to September 10. The annual broodstock collection protocols will determine the daily operations at the Nason Creek and Chiwawa River weirs and the Tumwater Dam trap.
- c. WDFW shall remove the captured fish from the traps daily when the traps are operating. Those fish not retained for broodstock shall be passed upstream of the weir for natural spawning after being handled for enumeration and the collection of biological information.
- d. WDFW must provide seven-day-a-week on-site monitoring of the adult traps and acclimation sites when in operation. The adult trap/holding box must be secured with locking lids or other mechanisms to prevent vandalism and/or unauthorized take.
- e. WDFW shall mark all hatchery-produced Nason Creek and Chiwawa River spring chinook salmon to allow the segregation of adults for broodstock and evaluations of escapement and natural production in the Wenatchee River Basin.
- f. After the adult fish are spawned, WDFW shall incinerate or bury all UCR spring chinook salmon carcasses if there is not a research, educational, or public outreach purpose identified, or distribute the carcasses in the Wenatchee River watershed for stream fertilization purposes if disease protocols are met.
- g. WDFW shall report to the Hatcheries and Inland Fisheries Branch, NMFS annually on the number of adult, endangered, UCR spring chinook salmon collected and retained for broodstock and the details of the spawning procedures that were implemented. The report shall include a description of the origin (in-basin or out-of-basin; naturally produced or hatchery-produced (when possible)), as well as the proportion of males and females, of all spring chinook salmon used for artificial spawning. WDFW shall also provide detailed information (number, origin, sex, condition) on the adult fish released for natural spawning.

- h. Prior to any hatchery-produced juvenile fish releases and/or transfers, WDFW must receive approval from the Hatcheries and Inland Fisheries Branch, NMFS for the number, stock origin, release dates, and release location(s) of the fish to be released and/or transferred. A plan describing proposed fish releases or transfers, developed annually by the Joint Fishery Parties and the Mid-Columbia Coordinating Committee, must be submitted to NMFS two months prior to any such releases or transfers.
- i. With the cooperation of the USFWS, WDFW shall develop an identification method for each of the production groups in the Methow River Basin (Twisp River stock, Chewuch River stock, Methow River composite stock Winthrop NFH Carson-stock spring chinook and others) to allow for the broodstock segregation of returning adults and evaluation of escapement and natural production.
- j. WDFW shall determine the origin (in-basin or out-of-basin; naturally produced or hatchery-produced (when possible)) of all spring chinook salmon retained prior to spawning. WDFW shall avoid using marked spring chinook salmon originating outside the Mid-Columbia River region for broodstock. Coded wire tags shall be read and the origin of each adult spawner shall be determined. The progeny of the adults captured at Wells Dam that are from the Entiat River or the Wenatchee River programs shall be transferred to their hatchery of origin if consistent with fish health protocols. Adult hatchery fish that are determined to originate from Winthrop NFH shall be transferred to Winthrop NFH.
- k. WDFW shall individually mark/tag or segregate collected adults to identify them by time of arrival. If too many adults are collected because the actual run size differs substantially from the predicted run size, adults may be selected for return to the river for natural spawning. Late arriving adults shall be genotyped through in-situ scale pattern analysis and maturation timing to help ensure that ocean-type chinook salmon are not inadvertently included in the broodstock.
- l. WDFW shall spawn both listed hatchery x natural and natural x natural crosses to the extent possible and evaluate the success of the two types of crosses. When possible, naturally produced fish retained for broodstock shall represent the natural-origin population in terms of age composition, sex ratio, and run timing .
- m. To the greatest extent possible, WDFW shall maintain known Twisp River spring chinook salmon as a separate broodstock within the hatchery. The progeny of known Twisp River spring chinook salmon shall be distinctly marked for identification purposes.
- n. To minimize the lateral transfer of pathogens, a sterilized needle must be used for each individual injection when PIT-tagging ESA-listed fish.

- o. All ESA-listed fish handled out-of-water for the purpose of recording biological information must be anesthetized. Anesthetized fish must be allowed to recover (e.g. in a recovery tank) before being released. Fish that are simply counted must remain in water but do not need to be anesthetized.

B. Alternative 2 - Issue Permit Without Conditions

Alternative 2 would encompass the issuance of a permit under section 10(a)(1)(A) of the ESA unconditionally, i.e., based strictly on the application submitted by WDFW. The permit would authorize the take of listed species, but no special conditions would be imposed. The original application included activities for the adult supplementation programs and for a juvenile captive broodstock program. During the consultation process for the application, WDFW and the other management parties decided to address the captive broodstock program under another consultation process. The application reflects the adoption of protocols for artificial propagation of ESA-listed species that are risk-averse and include the most current science on management of hatchery facilities and genetic impacts of artificial propagation. With the exception that special conditions would not be imposed by NMFS, the description of this alternative mirrors the description of the proposed action (section II, Alternative 1, above).

C. Alternative 3 - Do Not Issue a Permit (No Action)

Under a No Action alternative, NMFS would not issue an ESA section 10(a)(1)(A) permit to WDFW authorizing direct take of ESA-listed species associated with the proposed activities. This alternative would effectively prohibit the collection of ESA-listed fish for broodstock, supplementation of the population, and further research on the status of the ESA-listed population in the proposed action areas because WDFW would likely be in violation of the ESA. Even 4(d) take limit regulations are not available because the UCR spring chinook are listed as Endangered. The programs could be terminated or altered to rear non-listed species but neither of these options would satisfy the stated purpose and need as described above. To provide the broadest range of effects for the purpose of this analysis, NMFS assumes that the spring chinook programs would be discontinued if the permit is not issued.

III. AFFECTED ENVIRONMENT

A. Physical Environment

Artificial propagation activities can effect the physical environment by impacting water quantity and water quality. Water quantity can be impacted through water withdrawals from a river or stream for use in the hatchery facility. Water quality can be effected by the release of hatchery effluent that can impact water temperature, dissolved oxygen, sediment, suspended solids and water chemistry. Water quality can also be effected by hatchery facility construction activities

that could potentially impact sediment levels and water chemistry. The construction of weirs and water intake structures can impact the in-stream habitat, prevent the movement of streambed materials and alter flow patterns.

Riparian Habitat: The possible impacts to riparian habitat and associated vegetation would occur primarily through activities directly related to the facilities used for trapping and rearing ESA-listed fish and the maintenance and repair of existing facilities. Impacts may also occur from the construction of hatchery facilities, presently no new hatchery facilities are proposed. Impacts to riparian areas will be mitigated by design criteria and will affect only a few acres in the UCR drainage. The riparian habitat maybe effected over the long term by the increased recycling of marine nutrients through the riparian vegetation and the associated fauna.

B. Biological Environment

1. Anadromous Fish Listed Under the ESA

Since 1991, NMFS has identified twelve populations of Columbia River Basin salmon and steelhead as requiring protection under the ESA (Table 1). The two ESUs expected to be impacted by the artificial propagation program covered in this EA and their current listing status are described below. Both of the ESA-listed species include some portion of artificially propagated fish as well as the wild/natural populations.

The biological attributes of salmon and steelhead, the dimensions and variability of the Columbia River system and the natural cycles in the ocean environment make determination of the effects from the proposed artificial propagation activities downstream of the action area very difficult. The other species listed in Table 1 interact with fish produced by the WDFW's artificial propagation activities in the migration corridor and the ocean environments. However, impacts to the other listed species from these activities are considered so small as to be negligible, thus analysis of impacts from these activities on the biological environment will be limited to UCR spring chinook salmon, UCR steelhead and bull trout.

- a) *Upper Columbia River spring chinook:* The Upper Columbia River spring chinook salmon ESU was listed as endangered on March 24, 1999 (64 FR 14308). This ESU includes stream-type spring chinook salmon populations originating from all areas of the Columbia River basin upstream of Rock Island Dam (Myers *et al.* 1998). Production areas include the Wenatchee, Methow, and Entiat River Basins. WDF *et al.* (1993) identified nine stocks within this ESU. All stocks, with the exception of the Methow stock, were considered by WDF *et al.* (1993) to be of native origin, of "wild" production type, and as "depressed" in status. The Methow River spring chinook salmon stock is considered to be "composite" in production type, but of native origin, and depressed in status. When listing the UCR spring chinook salmon as endangered, NMFS included six hatchery populations as part of the ESU: Chiwawa River, Methow River, Twisp River, Chewuch River, White River, and Nason Creek. These six hatchery populations were considered to be essential for recovery and were therefore listed as part of the ESU.

Hatchery populations at Winthrop NFH, Entiat NFH, and Leavenworth NFH were not included as part of the ESU because they were derived from Carson NFH spring chinook salmon.

Table 1. The 12 listed salmon and steelhead ESUs in the Columbia River Basin (T: Threatened; E: Endangered) and their final listing notices.

ESU	Status	Federal Register Notice
Snake River spring/summer chinook	T	57 FR 14653 (April 22, 1992)
Upper Columbia River spring chinook	E	64 FR 14308 (March 24, 1999)
Lower Columbia River chinook	T	64 FR 14308 (March 24, 1999)
Upper Willamette River chinook	T	64 FR 14308 (March 24, 1999)
Snake River fall chinook	T	57 FR 14653 (April 22, 1992)
Snake River steelhead	T	62 FR 43937 (August 18, 1997)
Upper Columbia River steelhead	E	62 FR 43937 (August 18, 1997)
Lower Columbia River steelhead	T	63 FR 13347 (August 19, 1998)
Middle Columbia River steelhead	T	64 FR 14517 (March 25, 1999)
Upper Willamette River steelhead	T	64 FR 14517 (March 25, 1999)
Snake River sockeye	E	56 FR 58619 (November 20, 1991)
Columbia River chum	T	64 FR 14508 (March 25, 1999)

Historically, artificial propagation efforts have had a significant impact on spring-run chinook salmon populations, either through hatchery-based enhancement or the extensive trapping and transportation activities associated with the Grand Coulee Fish Maintenance Project (1939-1943), which was intended to mitigate the effects of dam construction and habitat loss by aiding depressed salmon stocks. Artificial propagation efforts now focus on supplementing the naturally spawning salmonid populations to encourage stock recovery and sustainability.

Upper Columbia River spring chinook salmon have a stream-type life history. Spring chinook salmon destined for the upper Columbia River and tributaries begin entering the Columbia River in late February and early March, with approximately 50 percent passing Priest Rapids Dam by mid-May. Fish enter the Methow from mid-May through July and primarily use the upper mainstem reaches of the Methow, Chuwach, Lost and Twisp rivers. Spawning occurs from late July through mid-September; fry emerge in April and May. Juveniles spend the next year in fresh water prior to migrating downstream in the spring. Spring chinook salmon returning to the Wenatchee River have similar run timing

with spawning starting about the second week of August and peaking in the first week of September. Spawning time is dependant on water temperature and generally begins when water temperatures are between 42.4 F and 57.5 F (Mullen 1987 in WDF *et al.* 1990). Fry emerge from January to February and rear in freshwater for up to a year prior to outmigrating in the following spring.

- b) *Upper Columbia River steelhead*: The Upper Columbia River steelhead ESU was listed as endangered on August 18, 1997 (62 FR 43937). This ESU inhabits the Columbia River and tributaries upstream of the Yakima River. It includes rivers mostly draining the east slope of the Cascade Mountains. This area includes several rivers which originate in Canada, but it is not thought that steelhead ever occurred in Canada in large numbers; this ESU is defined to include only U.S. populations. This entire ESU has been heavily influenced by hatchery programs, with a thorough mixing of stocks as a result of the Grand Coulee Fish Maintenance Project beginning in the 1940s (Fish and Hanavan 1948; Mullan *et al.* 1992). Until very recently, hatchery releases were composed of a composite of basin stocks. The Wells Hatchery stock is included in the listing. Currently, efforts are underway to develop hatchery programs from more locally-adapted stocks, using naturally spawning fish.

The life history of this ESU is similar to other inland steelhead ESUs. However, smolt ages in this ESU are some of the oldest on the west coast (up to 7 years old), likely as a result of the ubiquitous cold water temperatures (Mullan *et al.* 1992). Adults of this ESU spawn later than most downstream populations. Adults of the Methow River and Wenatchee River populations primarily return after 2 years of ocean residency. Steelhead from this ESU enter the lower Columbia between May and September with fish arriving at Wells Pool in early July. Fish enter the Wenatchee and Methow rivers in mid-July and peak between mid-September and October. During winter, fish generally return to the warmer Columbia River and re-enter the Methow to begin spawning in mid-March after ice-out. Spawning continues through May and many fish seek out higher reaches in the tributaries. Fry emergence occurs that summer and juveniles rear for two to four years prior to spring downstream migration. Adult steelhead can potentially be handled during broodstock collection activities.

2. Other ESA-listed Fish Species

Bull Trout - Another ESA-listed fish species that could be present in the areas where the hatchery activities are proposed to occur is bull trout. Bull trout in the Columbia River basin were listed as threatened on June 10, 1998 (63 FR 31647). The Columbia River population segment encompasses a vast geographic area including portions of Idaho, Montana, Oregon, Washington, and British Columbia. Bull trout are present, and locally common, in most of the habitat occupied by anadromous fish in the upper Columbia River Basin. WDFW (1997) identified 17 bull trout stocks in the Methow River watershed, most are located in the headwater tributaries. The status of these stocks was listed as unknown except for the Lost River stock which was considered healthy (WDFW 1997). In the Wenatchee River, WDFW (1997) identified 11 bull

trout stocks located in the headwater tributaries, out of these 11 stocks, 4 stocks were identified as being healthy and the remaining seven as unknown.

Bull trout populations are known to exhibit four distinct life history forms: resident, fluvial, adfluvial, and anadromous. Resident bull trout spend their entire life cycle in the same (or nearby) streams in which they were hatched. Fluvial and adfluvial populations spawn in tributary streams where the young rear from 1 to 4 years before migrating to either a lake (adfluvial) system or a river (fluvial) system, where they grow to maturity. Anadromous fish spawn in tributary streams, with major growth and maturation occurring in salt water this form is not present in the Methow and Wenatchee rivers.

Bull trout spawn from August to November as the water temperatures begin to decline. Depending on water temperature, the fry will emerge in 100 to 145 days. Juveniles remain in the substrate for some time after hatching. Fry will emerge from the gravel in about April. Bull trout populations are fragmented with many individual populations being isolated in one drainage. The distribution of this species appears to be greatly influenced by habitat components such as water temperature (bull trout prefer colder streams), cover, channel form and stability, substrates and migratory corridors (WDW *et al.* 1990). Bull trout have complex life stage habitat needs. This species utilize large woody debris, undercut banks, boulders and pools. Altered stream flow can disrupt spawning and channel stability is a large factor in egg survival. It is believed that the migratory bull trout occasionally spawn outside of their own natal area, thus over time the genetics remain stable. Migrating adult bull trout are sometimes encountered at weirs during broodstock collection activities.

3. Non-listed Fish Species

Approximately 60 other species of fish live in the Columbia River and tributaries. About half are native species primarily of the families *Salmonidae*, *Catostomidae*, *Cyprinidae*, and *Cottidae*. White sturgeon, *Acipenser transmontanus*, occurs in the mainstem Columbia River. The Columbia River Basin also supports at least 25 introduced species primarily representing *Percidae*, *Centrarchidae*, and *Ictaluridae*. Most of the introduced species are game fish which may be the targets of fisheries that could incidentally take ESA-listed anadromous salmonids.

4. Terrestrial Organisms

Because the scale of the proposed artificial propagation program is relatively small given the geographic region and because it makes use of existing hatchery facilities for the hatching and rearing stages, additional impacts to terrestrial organisms, ESA-listed or unlisted, are not anticipated to be substantial or long-lasting. The long-term benefits accruing to terrestrial piscivores and scavengers may be substantial if the project is successful in restoring the ESA-listed chinook salmon species. Excess carcasses from artificially spawned salmon would be added to the stream and the carcasses of naturally spawned fish will also be utilized naturally within the environment.

C. Socioeconomic Environment

Salmon are culturally, economically, and symbolically important in the Pacific Northwest. Columbia River chinook salmon populations were at one time acknowledged to be the largest in the world. Early traders, trappers, and settlers began arriving around 1800. These early immigrants began taking salmon for their own use and consumption, often trading for fish with local Indian tribes. Early attempts at commercial taking of salmon began in 1829, with salmon harvest as a commercial industry beginning in earnest by the mid-1880s. The first cannery on the Columbia River produced its first pack of canned salmon in 1866. By 1887, the number of canneries in the basin peaked at 39. Salting, mild-curing, and other methods of salmon preparation were also taking place, and Columbia River salmon were becoming well-known internationally. The total production of canned, mild-cured, and frozen salmon and steelhead in the Columbia River Basin rose from 272,000 pounds in 1886 to annual productions between 20 and 50 million pounds from 1874 through 1936.

The gear used to fish commercially for Columbia River salmon included gill nets, purse seines, traps, dip nets, fish wheels, and a variety of other methods (Craig and Hacker 1940). The combined gear types were landing an average of nearly 24.5 million pounds of salmon and steelhead annually between 1927 and 1934. The increased use of gasoline engines on boats enhanced the development of trolling as a commercial salmon harvest method after about 1905, predominantly for chinook and coho salmon. Between 1926 and 1934, the average annual troll catch in the Columbia River was 894,000 pounds of chinook and 2.6 million pounds of coho salmon.

In the early 1900s, increased agriculture, industry, and land development began to reduce the amount of suitable habitat for salmon spawning and rearing. In that period, the annual catch of chinook salmon fluctuated widely. As chinook salmon abundances began to decline, starting around 1911, the focus of commercial harvest operations began to shift more to other species. As total salmonid abundances in Columbia River fisheries continued to decline, concerns for the continued health of salmonid stocks increased. Management actions began to be developed and implemented to slow the decline of salmon abundances, including the elimination of fish wheels and purse seines on the Columbia River, and reduced commercial gillnet seasons.

In recent years, with severely reduced salmonid numbers due primarily to habitat degradation and hydropower development in the mainstem river, commercial and recreational fisheries have been considerably curtailed from earlier levels. Currently, harvest is not considered to be as great a source of salmonid population decrease as habitat degradation and hydropower projects. Harvest rates are managed at conservative levels until improvements in other sectors of the environment are able to take effect. In addition to their role in maintaining the viability of salmonid populations, the salmon hatchery programs contribute fish to recreational, commercial, and tribal fisheries throughout the Columbia River Basin:

- Natural and hatchery-origin salmon continue to play an important role for Native American cultural, religious, subsistence, and commercial purposes in the action area. The current depressed status of listed spring chinook salmon and steelhead populations

has severely limited many of the cultural practices and subsistence uses of salmon by the local tribes.

- The poor status of the listed populations has also curtailed economic and cultural benefits for non-Indian recreational fisheries that the salmon resource formerly supported. Numerous jobs are indirectly (e.g., commercial fishers and retailers) and directly (e.g., fish culturists and fish managers/regulators) associated with or affected by the proposed salmon hatchery programs and the listing of the species under the ESA. The current status of the salmon populations has also required land and water use restrictions, which have adversely affected uses of local resources by landowners and local industries within the action area; for example, in the Methow River basin irrigation water withdrawals have been shut down to protect listed fish.

IV. POTENTIAL ENVIRONMENTAL EFFECTS

A. Alternative 1 - Issue Permit With Conditions (Proposed Alternative)

1. Effects on the Physical Environment

The effects to the physical environment resulting from implementation of the proposed artificial propagation program would include impacts to water quantity and water quality. To limit impacts to water quantity WDFW will comply with water right permits established for each hatchery to prevent over appropriation of surface water. WDFW hatchery programs rely mainly on ground water withdrawal. Hatchery surface water intakes are screened to current criteria. Water quality is affected by effluent from the WDFW hatcheries, but all the hatchery facilities are required to operate under National Pollutant Discharge Elimination System (NPDES) permits issued by Washington Department of Ecology. Hatchery effluent standards and state point source discharge criteria are set forth in the permit to protect aquatic life, and the habitat in the area below the discharge points. To monitor water quality and the impacts of hatchery effluent, WDFW monitors total suspended solids, settleable solids, upstream and downstream temperatures, and upstream and downstream dissolved oxygen. Considering that the effluent produced from the hatchery facilities complies with Environmental Protection Agency standards, coupled with the low percentage of effluent to discharge (dilution factor), there is a low possibility that effluent produced at these facilities will negatively impact the physical environment.

2. Effects on the Biological Environment

Effects on ESA-listed Anadromous Fish

The expected impacts to ESA-listed fish species in the upper Columbia River Basin from the proposed artificial propagation program will mainly be limited to the spring chinook salmon in the upper Wenatchee and Methow River drainages. The only other ESA-listed fish species expected to occur in the action area are UCR steelhead and bull trout (discussed below).

The proposed take of ESA-listed salmon for broodstock is summarized in WDFW's permit application (WDFW 1998). WDFW proposes to operate the adult weir in the Chiwawa River and Nason Creek (Wenatchee River Basin) to collect no more than 400 adult and jack spring chinook salmon annually for broodstock to meet the smolt production goals of the program. No more than one-third of the spring chinook salmon adults that return to the adult weirs will be collected for broodstock; the remaining adult fish will be passed upstream of the weir for natural spawning. WDFW proposes to collect returning adult and jack spring chinook salmon for the Methow River Basin program at Wells Dam and, when necessary, at the Twisp River weir, the Chewuch River weir, Foghorn Dam, and/or the Methow SFH. When the total adult return to Wells Dam is estimated to be 668 adults or fewer, all of the fish will be placed into the adult-based supplementation program. When the total adult return to Wells Dam is estimated to be at least 669 but no more than 964, a minimum of 296 adults (approximately 44 percent) will be passed upstream for natural spawning while the rest of the fish will be placed into the adult-based supplementation program. When the total adult return to Wells Dam is estimated to be greater than 964, the collection of adults for broodstock will be at levels to meet current production objectives; the adult fish not collected for broodstock will be passed upstream for natural spawning. While the hatchery program has the potential to cause deleterious direct and indirect effects on the ESA-listed species, such as maladaptive genetic, physiological, or behavioral changes in donor or target populations (Hard et al. 1992), the program will continue to be necessary to prevent the extinction of the ESU until habitat conditions that limit the productivity of naturally-produced spring chinook salmon in the region can be improved.

Hazards associated with supplementation programs are weighed against the prospect that successful programs can produce many more returning adult fish than are produced naturally. Given that the extinction of the natural component of UCR spring chinook salmon is likely before natural recovery can occur, the parties to the Mid-Columbia Mainstem Conservation Plan (MCMCP), which includes WDFW, NMFS, USFWS, the Yakama Nation, the Confederated Tribes of the Colville Reservation, the Confederated Tribes of the Umatilla Indian Reservation and Douglas, Chelan, and Grant County Public Utility Districts, have determined that the implementation of a supplementation program for UCR spring chinook salmon is warranted. The parties of the MCMCP believe that the potential risks posed by artificial propagation to the ESA-listed species are out-weighed by the potential to rapidly increase abundance and avoid extinction over a relatively short period of time. The proposed artificial propagation program is intended to facilitate recovery of the natural component of the species while minimizing the risk of further decline and restricting the genetic changes that can result from artificial propagation programs. Measures designed to minimize and mitigate impacts to the ESA-listed species include the use of more than one artificial propagation strategy, incremental changes in production levels, predetermined means to manage stray fish, and two approaches for population separation. When implemented, these measures will help to minimize the risk of genetic and/or ecological hazards to the ESA-listed species.

In addition, existing policies regarding hatchery operations, maintenance protocols, fish health practices, genetic effects, ecological interactions, and fish cultural practices, as prescribed in the

1994 Integrated Hatchery Operations Team annual report (IHOT 1995), will be followed. Smolt production levels as a result of WDFW's proposed hatchery supplementation program will also be compatible with allowable levels defined through the basin-wide annual production ceiling set by NMFS (NMFS 1995, NMFS 1999).

Effects on Other ESA-listed Fish Species

Steelhead – Listed summer steelhead may be handled during spring chinook salmon broodstock collection activities at Wells Dam and at weirs in the tributaries. It is expected that the incidental catch and release of listed UCR steelhead will be no more than 100 adults of which no more than 10 would be mortalities. The impact of the loss of 10 adult steelhead is considered small considering that the recent 5-year mean escapement of summer steelhead was 4,155 as measured at Wells Dam. In 2001, the escapement of summer steelhead over Wells Dam was 18,483 adults. The native steelhead co-evolved with the native chinook salmon stock and would be expected to suffer no negative impacts from the restoration of the chinook salmon population. ESA-listed steelhead and the ESA-listed salmon population would both be expected to benefit from the recycled marine nutrients added to the ecosystem by natural spawning hatchery fish and the outplanting of hatchery spawned salmon carcasses.

Bull Trout – The impacts to threatened bull trout are expected to be negligible. This species is likely to be present in the waters where the proposed hatchery activities will take place. Bull trout are rarely seen in the hatchery fish ladders and holding ponds however they are encountered at adult weirs during broodstock collection activities. WDFW has established specific procedures for handling bull trout encountered at these facilities, with bull trout being enumerated and released unharmed back into the river away from the weir. No mortalities are expected. Bull trout co-evolved with chinook salmon and restoring the fully functional ecosystem with spawning salmon would not be expected to have a negative impact. Larger bull trout are piscivorous and may utilize the additional salmon eggs, fry, and parr as a forage resource. Bull trout would also be expected to benefit from the recycled marine nutrients added to the ecosystem by natural spawning hatchery fish and the outplanting of hatchery spawned salmon carcasses.

Effects on Non-listed Fish Species

Non-listed fish species may be encountered during the operation of the fish ladder, and affected by the hatchery effluent and the withdrawal of water. Non-listed species that are encountered during hatchery operations will be released unharmed, no mortalities are expected. Non-listed fish species may be effected by the hatchery effluent but these effects are limited to the point of release. Impacts from the water withdrawals that may entrain non-listed species are not expected to be negligible. Resident fish species would be expected to benefit from the nutrient enrichment and the ecosystem restoration impacts that would occur concurrently with the recovery of the salmon populations. In contrast, non-endemic species may be reduced as the habitat recovers, favoring listed salmon over the introduced species that prefer degraded habitat.

3. Effects On The Socioeconomic Environment

The principal, short-term impact of WDFW's proposed UCR spring chinook salmon supplementation program would be to restore the opportunity for non-consumptive observation of spawning salmon and the unquantifiable existence value of the species. The hatchery program is expected to continue into the future as mitigation for the operation of the hydropower projects whose impacts cannot be minimized through design and operational changes. If the project has long-term success, the availability of salmon for ceremonial and subsistence uses by the treaty Indian tribes would increase. Eventually, the project may contribute to self-sustaining salmon populations and increased opportunity for recreational fisheries. Recreational fishing provides income and employment opportunities in remote, rural communities located in the Columbia River Basin. In the future, if the hatchery program contributes to the recovery of listed spring chinook, human activities that are currently restrained because they impact fish habitat may be expanded (i.e., water withdrawals, resource extraction, development).

Environmental Justice: Executive Order 12898 (February 11, 1994), *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires federal agencies to include consideration of potential effects on minority and low-income communities when evaluating impacts of these projects on the human environment. The hatchery programs are not expected to adversely affect minority and low-income communities and will have only minor socioeconomic effects as described above.

4. Cumulative Effects

Cumulative impacts from NMFS' proposed issuance of a section 10(a)(1)(A) permit, including additional special conditions as described, will be minor if at all measurable. Incremental impacts on the environment are included in the discussion above. NMFS' permitting of the described activities is only one element of a large suite of regulations and environmental factors that may influence the overall management of artificial propagation actions in the affected environment, and that may impact the health of listed salmon populations and their habitat. Those programs that meet the requirements of section 10 and its implementing regulations will include monitoring and adaptive management measures so that basin co-managers can respond to changes in the status of affected listed salmon. Monitoring and adaptive management will help ensure that the affected ESUs are adequately protected and help counter-balance any negative cumulative impacts.

B. Alternative 2 - Issue Permit Without Conditions

The purpose of permit conditions is to prescribe requirements and/or restrictions that are expressly designed to minimize impacts to ESA-listed fish. Issuing permits and permit modifications to agencies or tribes without conditions would result in many of the same environmental impacts described in the proposed action alternative because many of the techniques that result in permit conditions are provided as proposed strategies in permit applications. However, not imposing conditions in permits could potentially result in unexpected environmental impacts if impact minimization strategies are significantly altered or are not

implemented by the Permit Holder. Establishing conditions in permits ensures that measures will be implemented by the Permit Holder to minimize adverse impacts to ESA-listed fish and that the actions of the agencies and tribes will not appreciably reduce the survival and recovery of ESA-listed species. In addition, NMFS' conditions may serve to further limit WDFW's activities in such a way as to enhance the proposed conservation efforts. NMFS has therefore determined that this alternative is not prudent.

C. Alternative 3 - Do Not Issue a Permit (No Action)

If this alternative is chosen, the implementation of WDFW's proposed hatchery supplementation program would result in the unauthorized take of ESA-listed anadromous fish species. Therefore, the implementation of the program could not proceed without violating the ESA.

1. Effects On the Physical Environment

Selection of the "No Action" alternative would be expected to result in no additional adverse impacts to the physical environment. The closure of the proposed spring chinook programs would not necessarily decrease impacts to the physical environment. Production capacity at the WDFW hatchery facilities would most likely be used to rear non-listed salmon species or listed steelhead. If this occurred, impacts would be similar to the proposed alternative. Impacts might be reduced because spring chinook broodstock would not be collected at the remote locations, but the reduction in hatchery spring chinook returns may impact the environment by decreasing the amount of marine derived nutrients that would have been released into the watershed from hatchery carcasses.

2. Effects On the Biological Environment

Effects on ESA-listed Anadromous Fish

Under the "No Action" alternative, annual takes of endangered UCR spring chinook salmon associated with WDFW's hatchery supplementation programs would not be authorized. The Biological Opinion that analyses the proposed artificial propagation project to enhance the survival of the ESA-listed species is expected to conclude that the proposed action will not jeopardize the continued existence or impede the recovery of the ESA-listed species that may be affected by the action. To meet production goals in both the Wenatchee River and Methow River hatchery programs, under the proposed alternative, up to 1,150 adult listed spring chinook are needed for broodstock. If the program is shut down, then these fish would not be retained and most likely would be allowed to spawn naturally.

The UCR spring chinook salmon species is at risk of extinction. The species' numbers have declined steadily for 30 years. The risk of extinction and the hazard of the loss of genetic diversity is increased by the extremely low numbers of parents in each generation. Unless substantial and long-term changes occur in all the factors affecting the survival of the UCR spring chinook salmon ESU, they would not be expected to recover. The proposed artificial propagation activities were identified by the parties to the Mid-Columbia Mainstem Conservation Plan as being necessary to rapidly increase abundance of UCR spring chinook salmon and to

avoid extinction for some of the populations in the ESU. The recovery of the species is unlikely to occur without this type of intervention. Due to the chronic reduction in the flow of marine nutrients into the freshwater ecosystem from the low number of salmonid carcasses, the productivity of the aquatic and riparian ecosystems will continue to remain low.

Under the “No Action” alternative, ESA-listed UCR steelhead and bull trout would not benefit from the restored productivity and increased forage supply that could be provided by a restored salmon population. These species may benefit from the reduced potential for being trapped and handled during broodstock collection activities in the tributaries and at the hatchery. However, impacts may be similar or increased if another non-listed species was produced to replace the production capacity lost in this alternative.

Effects on Non-listed Fish Species

The discontinuation of the listed spring chinook program may reduce effects on non-listed fish from the operation of the trapping facilities, release of effluent and from water withdrawal. Impacts may not change if other species are reared at the hatchery to replace the discontinued spring chinook production. The effect of the alternatives on non-listed species is negligible and the difference between the alternatives would be even smaller. In addition, the non-listed fish species would receive no benefit from nutrient enrichment, but because the salmon populations have been reduced for so long, the effect of a continued lack of nutrients would not be measurable.

3. Effects On The Socioeconomic Environment

Selection of the “No Action” alternative would leave the UCR spring chinook salmon ESU at the current low numbers. The risk of extinction or loss of important genetic material would continue or increase. No fish would be available for treaty tribal ceremonial and subsistence use or for recreational fishing opportunity. Should the UCR spring chinook salmon become extinct, the existence value of the species would also be lost. If UCR spring chinook salmon continue to decline, it would be expected that more restrictions on activities affecting UCR spring chinook salmon habitat would be necessary. These additional restrictions would impact water withdrawals for domestic and agricultural uses, grazing, mining and timber harvest and development within the watersheds.

Environmental Justice: Executive Order 12898 (February 11, 1994), *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires federal agencies to include consideration of potential effects on minority and low-income communities when evaluating impacts of these projects on the human environment. Under the “No Action” alternative, the removal of the hatchery programs are not expected to adversely affect minority and low-income communities and will have only minor socioeconomic effects as described above.

V. AGENCIES CONSULTED

The following agencies and entities were consulted during the development of this environmental assessment.

National Marine Fisheries Service
U.S. Fish and Wildlife Service
Washington Department of Fish and Wildlife
Yakama Nation
Colville Confederated Tribes
Confederated Umatilla Tribes
Douglas County PUD
Chelan County PUD
Grant County PUD

VI. REFERENCES

Federal Register Notices

- 58 FR 17573. April 5, 1993. Endangered and threatened species: Interim policy on artificial propagation of pacific salmon under the Endangered Species Act. Federal Register 58(63): 17573-17576.
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- 63 FR 31647. June 10, 1998. Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the Klamath River and Columbia River Distinct Population Segments of Bull Trout. Federal Register 63(111): 31647-31674.
- 64 FR 14308. March 24, 1999. Final Rule, Endangered and Threatened Species: Threatened status for three chinook salmon evolutionarily significant units (ESUs) in Washington and Oregon, and endangered status for one chinook salmon ESU in Washington. Federal Register 64(56): 14308-14328.

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- NMFS (National Marine Fisheries Service). 1995. Biological Opinion for 1995 to 1998 hatchery operations in the Columbia River Basin. NOAA/NMFS, ETSD, Portland, OR. April 5, 1995. 82 p.
- NMFS (National Marine Fisheries Service). 1999. Biological Opinion On Artificial Propagation in the Columbia River Basin. Incidental Take of Listed Salmon and Steelhead from Federal and Non-Federal Hatchery Programs that Collect, Rear and Release Unlisted Fish Species. March 29, 1999. NMFS, Portland, OR. 175 p. plus appendices.
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VII. FINDING OF NO SIGNIFICANT IMPACT

Summary

The National Marine Fisheries Service (NMFS) Northwest Region (NWR) has prepared an Environmental Assessment (EA) for its proposed issuance of a permit pursuant to section 10(a)(1)(A) of the Endangered Species Act (ESA). The permit (#1196) would be issued to the Washington Department of Fish and Wildlife (WDFW) for annual take of ESA listed Upper Columbia River (UCR) spring chinook in association with the WDFW UCR spring chinook enhancement programs. The permit would expire December 31, 2007.

NMFS considered and analyzed the following alternatives, all of which are discussed in detail in the EA:

Alternative 1 - Proposed Action: Issue the permit based on the application with additional specific conditions to minimize adverse impacts to the ESA listed salmonids and to enhance conservation efforts.

Alternative 2 - Issue the permit based on the application without any additional specific conditions.

Alternative 3 - No Action: Do not issue the permit, which would potentially result in WDFW being in violation of the ESA if it continued the enhancement program.

The proposed action was selected as the preferred alternative because it will allow WDFW to implement an enhancement program that is designed to assist in the recovery of ESA listed endangered UCR spring chinook salmon in the Wenatchee and Methow river basins in the state of Washington. That program is fully described in the EA and in the permit application submitted by WDFW.

Implementation of NMFS' decision would be expected to result in the following environmental, social and economic effects:

- Effects on water quantity and water quality from water withdrawals and hatchery effluent.
- Potential deleterious effects from artificial propagation such as maladaptive genetic, physiological and behavioral changes, disease transmission and reduction in the number of adults spawning in the wild are out-weighted by the potential to rapidly increase abundance and avoid extinction over the relatively short-term.
- Effects on other ESA listed species through trapping activities that have the potential to handle listed steelhead and bull trout.
- Benefits to listed fish and other resident species from recycled marine nutrients added to the ecosystem.
- Restoration of non-consumptive observation of spawning salmon and existence values.

- Mitigation for continued impacts from the hydrosystem where impacts cannot be minimized through design and operational changes.
- Potential to provide ceremonial and subsistence uses to treaty tribes and the opportunity for recreational fisheries.

These are fully described in the EA.

In the EA, NMFS considered the context and intensity of the factors identified in NOAA NAO 216-6 section 6.01b, as well as short and long term effects of the proposed action. Based on the analysis in the EA, NMFS finds that:

1. Public health and safety will be minimally affected by the selected alternative. Any degradation of water quality will be restricted to the areas immediately adjacent to hatchery water discharges, and any adverse effects will be localized and temporary.
2. The selected alternative's effects on the human environment are not likely to be highly controversial based on a review of the absence of new information during the public comment period and the low level of impact on socioeconomic resources expected (as described in the EA and Biological Opinion).
3. This action does not establish a precedent for future actions with significant effects nor does it represent a decision in principle about a future consideration because NMFS has analyzed many comparable programs and issued many comparable permits.
4. This action is of limited context and intensity, with limited environmental effects, individually or cumulatively. Cumulative impacts were considered but no significant cumulative impacts are expected from implementation of the proposed action.
5. The effects of this action are relatively certain and do not involve unique or unknown risks because this enhancement program is similar to other artificial propagation programs designed to conserve and supplement natural populations that NMFS has considered and authorized.
6. The proposed action will not adversely affect areas listed in or eligible for listing in the National Register of Historic Places, or cause loss or destruction of significant scientific, cultural or historic resources.
7. ESA-listed endangered UCR spring chinook salmon will be adversely affected by the proposed action. However, based on NMFS' biological opinion analyzing the proposed action under section 7 of the ESA, the proposed action will not appreciably reduce the likelihood of survival and recovery of UCR spring chinook salmon in the wild. ESA-listed endangered UCR steelhead and threatened bull trout may be affected by the proposed action; however, based on NMFS' biological opinion and USFWS' analysis, the

proposed action will not appreciably reduce the likelihood of survival and recovery of the UCR steelhead and bull trout ESUs in the wild.

8. The proposed action will not adversely modify or destroy designated critical habitat as defined by the ESA or designated essential fish habitat (EFH) as defined by the Magnuson-Stevens Act. The hatchery operations that are the subject of the proposed action will affect habitat features such as water quality, water quantity, adult passage impediment, predation, competition and exchange of disease organisms. As discussed in the EA and in NMFS biological opinion any adverse effects will be minimal, localized and temporary. The proposed permit conditions and operating procedures are designed to minimize the adverse effects.

9. The proposed action does not threaten a violation of Federal, State or local law requirements imposed for the protection of the environment. To comply with water quality standards, hatchery operators must obtain National Pollutant Discharge Elimination System (NPDES) permits.

Environmental Justice: Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. The analysis of the impacts in the EA indicates that there will be no impacts to minority and low-income populations resulting from the proposed action.

References:

NMFS. 2002. Environmental Assessment of National Marine Fisheries Service Issuance of Permit #1196 to the Washington Department of Fish and Wildlife under Section 10(a)(1)(A) of the Endangered Species Act. NMFS, Portland, OR.

Determination

Based on the analysis in the EA, I conclude that the proposed action to issue permit #1196 with specific conditions to WDFW pursuant to section 10(a)(1)(A) of the ESA does not constitute a major Federal action significantly affecting the quality of the human environment within the meaning of section 102(2)(c) of the National Environmental Policy Act of 1969 (as amended). Therefore, an environmental impact statement is not required.

for Rebecca Kent
William T. Hogarth, Ph.D.
Assistant Administrator for Fisheries
National Oceanic and Atmospheric Administration

August 9, 2002
Date